

CLAIMS

1. A method of testing integrity of a barrier by transferring material from one side of the barrier through a continuous path directly into a NMR analysis system and using the NMR analysis system to determine from the transferred material if there has been any leakage through the barrier.
2. A method of testing integrity of a barrier by transferring material from one side of the barrier for accumulation within a NMR analysis system and using the NMR analysis system to determine from the accumulating material if there has been any leakage through the barrier.
3. A method of testing integrity of a filled end product container, that is filled with the end product material, by using a NMR analysis system to determine whether end product material has leaked from the filled end product container and using this determination to validate the filled end product container.
4. A method for testing integrity of a barrier used to separate two materials by using a NMR analysis system to determine from the material on one side of the barrier if there has been leakage of material from the other side of the barrier without added helium tracer material.
5. The method of any preceding claim in which a pumping system is used to transfer materials into the NMR analysis system.
6. The method of any preceding claim that has a sniffing probe means that can be moved relative to the surface of the barrier so as to allow materials to be collected from different positions relative to the barrier for transfer into the NMR analysis system.

7. The method of claims 1 to 5 where a hood chamber partially covers and is sealed to the barrier or container surface so as to allow material from this section of the barrier or container surface to be collected for transfer into the NMR analysis system.
5. 8. The method of claims 1 to 5 where a chamber completely encloses the outer surfaces of a container so as to allow material ingress from the container to be collected for transfer into the NMR analysis system.
10. 9. The method of claims 1 to 8 where the container is electrical equipment charged with a fluid, and the testing comprises testing for leakage of this fluid from the container.
15. 10. The method of claims 1 to 8 where the container comprises an inhaler charged with end product filling materials including propellant fluid, and the testing comprises testing for leakage of this propellant fluid from the inhaler.
20. 11. The method of any preceding claim having a step of accumulating leakage in a separate chamber prior to transfer to the transfer to the NMR analysis system.
25. 12. The method of claim 11 or any claim dependent on claim 11, where the accumulation of material for analysis also occurs within the NMR analysis system.
30. 13. The method of any preceding claim where some or all of the fluid material contains fluorine compounds, and the NMR analysis involves detecting fluorine.
14. The method of claim 11 or any claim depending on claim 11, having a step of transferring the accumulated leakage into an NMR analysis system.

15. The method of claim 11 or any claim depending on claim 11, having a step of moving the accumulation chamber into an NMR analysis system.
- 5 16. The method of claim 11 or any claim depending on claim 11, having the steps of transferring the accumulation chamber contents into a second container for analysis and then transferring the second container contents into an NMR analysis system.
- 10 17. The method of claim 11 or any claim depending on claim 11, having the steps of transferring the accumulation chamber contents into a second container for analysis and then moving this container for analysis into an NMR analysis system.
- 15 18. The method of any preceding claim, having the step of carrying out the NMR analysis for multiple barriers, multiple containers, or both types, simultaneously.
- 20 19. The method of any of claims 1 to 18 having the step of cooling the materials.
20. The method of any preceding claim having the step of accumulating leakage on a cooled surface and measuring the amount accumulated.
- 25 21. The method of claim 20 having the cooled surface located within the NMR analysis system, to accumulate materials directly within the NMR analysis system.
- 30 22. The method of claim 20 having the step of moving the cooled surface relative to an NMR analysis system, to carry out the measurement after a period of accumulation.

23. The method of claim 11 or any claim depending on claim 11, having the step of evacuating the chamber that is to be used for accumulation prior to transfer into the NMR analysis system before accumulating material leakage.

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24. Test equipment having means for validating inhaler integrity using a NMR analysis system for analysis of material leakage accumulated within the NMR analysis system.

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25. The test equipment according to claim 24 having a transfer type vacuum pumping system means for transferring material leakage into the NMR analysis system.

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26. The test equipment according to claim 24 having a pressure pumping system means for transferring material leakage into the NMR analysis system.

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27. The test equipment according to claim 24 having a transfer type vacuum and pressure pumping system combination for transferring material leakage into the NMR analysis system.

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28. The test equipment according to claim 24 where the accumulated material has been transferred to another chamber means for introduction into the NMR analysis system for analysis of the leakage.

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29. The test equipment according to any of claims 24 to 28 where the fluid is fluorine containing and the NMR analysis is for ^{19}F nuclei contained within the fluid molecules.

30. The test equipment according to any of claims 24 to 29 having a cooled surface and means for transferring accumulated material to the NMR analysis system.

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31. The test equipment according to any of claims 24 to 30 having means for pre evacuating the accumulation chamber.

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32. The test equipment according to any of claims 24 to 31 whereby the cooling means comprises a Peltier effect device.

33. The test equipment according to any of claims 24 to 32 having means for using a material of the chamber to provide a calibration means for the NMR analysis system.

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34. The test equipment according to any of the claims 24 to 32 having means for introducing material to provide a calibration means for the NMR analysis system.

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35. The test equipment according to any of claims 24 to 27 having means for cross checking integrity validation with an off-line NMR analysis system.

36. A product validated by the method or equipment of any preceding claim.

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37. A product of claim 36 and having a mark to show it has been validated by the method or equipment of any preceding claim.

38. The product of claim 37, the marking being on packaging of the product.

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39. The product of any of claims 36 to 38, the marking being on product documentation and or literature or advertisements in any news media.